

**MW & BC Funded Projects
MSU
1984-85**

TITLE: Spring Wheat Breeding

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: W. Larry Alexander
Michael R. Wilson
Susan P. Lanning

AMOUNT FUNDED: \$62,380.00

OBJECTIVES:

1) Support for Montana Agricultural Experiment Station
Spring Wheat Breeding Project

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TITLE: County Field Crop Variety Demonstrations

INSTITUTION: Montana State University

DEPARTMENT: Montana Cooperative Extension Service

RESEARCHER: Donald E. Baldrige
Charles H. Rust

AMOUNT FUNDED: \$28,000.00

OBJECTIVES:

1) To obtain funding from MWRMC to purchase grain plat
harvesting equipment (self-propelled combine and trailer) to
enable Extension Specialists and county agents to obtain yield
performance data from cereal grain (wheat, barley and oats)
variety demonstration plots established on a county level in
Montana.

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TITLE: Design, construction, and availability of a small
plot precision planter for seeding recrop variety
trials under no-till, reduced till, and chemical

fallow conditions in eastern Montana

INSTITUTION: Montana State University

DEPARTMENT: Civil & Ag Engineering

RESEARCHERS: Bill Larsen, Jerry Bergman

AMOUNT FUNDED: \$19,500.00

OBJECTIVES:

1) To design and construct a small plot precision planter for the testing, evaluation and recommendation of small grain and oil crop varieties for production under specific recrop conditions in eastern Montana.

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TITLE: Development of Malting and Feed Barley Varieties
Adapted to Montana

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: Tom Blake, Patrick Hensleigh, Laura Tagliani

AMOUNT FUNDED: \$46,500.00

OBJECTIVES:

1) The development of high yielding spring barley cultivars adapted to dryland, irrigated and recropping conditions in Montana.

2) Development and improvement of lines with malting quality potential for dryland operators.

3) Development of varieties with improved feeding quality and malting quality through the use of proanthocyanidin deficiency genes.

4) Exploration of recurrent selection derived winter barley populations for recropping potential.

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TITLE: Early screening tests for winter hardiness in wheat plants using carbohydrate and soluble protein analysis.

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: Jarvis H. Brown, Allan Taylor, Michael J. Wille

AMOUNT FUNDED: \$16,400.00

OBJECTIVES:

1) Develop an early screening test for winter hardiness in wheat.

2) Explain the role of fructosans (inulin) in winter hardiness in cereals.

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TITLE: Development of Practical and Economic Continuous and other Cropping Systems for Grain Production in Montana.

INSTITUTION: Montana State University

DEPARTMENT: Research Centers

RESEARCHERS: Various

AMOUNT FUNDED: \$30,000.00

OBJECTIVES:

1) Under the traditional system of grain culture in Montana many problems associated with the alternate and cropfallow system indicate a needed change to new and practical methods of continuous cropping and/or other economic cropping sequences and related management techniques.

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TITLE: Acquisition of Specialty Research harvest Equipment

INSTITUTION: Montana State University

DEPARTMENT: Northern Agricultural Research Center

RESEARCHERS: Gregg Carlson, Harold A. Houlton

AMOUNT FUNDED: \$21,342.00

OBJECTIVES:

Purchase new research plot harvesting equipment

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TITLE: The Economic Impact of Wheat and Barley on Montana
Communities

INSTITUTION: Montana State University

DEPARTMENT: Agricultural Economics & Economics

RESEARCHERS: Merle D. Faminow, Bruce Benson

AMOUNT FUNDED: \$31,000.00

OBJECTIVE:

1) The objective of the proposed research is to determine the economic impact of the grain sector on different types of Montana communities. This requires that communities be classified as a spatial hierarchy according to the types of goods and services provided. For instance, a 1963 study of the spatial hierarchy for the upper Midwest, including Montana, identified eight levels in the hierarchy, six of which occurred in Montana. The smallest communities, called hamlets, contained a gasoline station, an eating place, and perhaps one or two other services. Figure I indicates the types of goods and services offered by the second through seventh levels of the hierarchy.

For example, given that a similar hierarchy exists today, one can imagine a wheat producer living next to Hogeland, Montana. A few services are available in Hogeland (e.g., some groceries), but for other services the farm family will have to travel to Turner (e.g., high school for the children). For still others (e.g., weekly paper, bank, movie theater, car dealer), Harlem is the nearest trading center. Chinook then provides the farm family with a wider range of goods and services (e.g., doctor, veterinarian, several clothing stores, implement dealers), but some needs can only be met in Havre (e.g., radio station, small daily paper, hospital, major railroad grain terminal, discount stores, collete). Finally, some of the goods and services purchased by that farm family

originate in Great Falls (e.g., TV stations, larger daily newspaper, major shopping and medical centers, stock brokers, wholesale outlets for many of the retailers in the small communities, etc.). (Naturally, some of the impacts of the Montana grain sector are felt in even larger centers like Portland and Minneapolis where the grain is ultimately gathered for processing or further distribution.)

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TITLE: Stimulating Dormant Wild Oat Seed Germination with Fusicoccin

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: Michael E. Foley, Susan Johnson

AMOUNT FUNDED: \$17,084.00

OBJECTIVES:

- 1) Primary dormant wild oat seeds germinate in the presence of Fusicoccin. We seek to determine the biochemical events occurring during Fusicoccin stimulated germination.

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TITLE: Barley Breeding and Germplasm Enhancement

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: E.A. Hockett, C.F. McGuire

AMOUNT FUNDED: \$14,000.00

OBJECTIVES:

- 1) To improve the agronomic characteristics and malting and feed quality of barley cultivars for Montana.

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TITLE: Grain Plot Harvester

INSTITUTIONS: Montana State University

DEPARTMENT: Western Triangle Research Center

RESEARCHERS: Gregory D. Kushnak

AMOUNT FUNDED: \$13,000.00

OBJECTIVES:

- 1) Maintain current level of off station cereal grain variety testing.
- 2) Expand variety testing to include recrop conditions.

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TITLE: Control of soil-borne disease of wheat and barley

INSTITUTION: Montana State University

DEPARTMENT: Plant Pathology

RESEARCHERS: Don Mathre, Robert H. Johnston

AMOUNT FUNDED: \$26,520.00

OBJECTIVES:

- 1) Continue research on the Take-all disease of irrigated spring wheat to evaluate the following:
 - a) Seed treatment with Baytan for control using commercial application and grower fields as well as small research plots.
 - b) The increase and possible decline in disease severity as affected by the use of a barley rotation crop to allow us to make better recommendations to growers prior to take-all becoming highly destructive.
 - c) Any change in virulence of the pathogen which might influence the use of barley as a rotation crop.

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TITLE: Potentials of Montana Soils

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: Gerald A. Nielsen
Cliff Montagne

AMOUNT FUNDED: \$18,800.00

OBJECTIVES:

- 1) Accelerate soil inventory processes and develop methods to monitor seasonal changes in soil, crop and weed conditions by aerial remote sensing techniques. Through the Preliminary Soil Survey Program we obtain background information about geology, climate and soils relationships that accelerates soil-mapping operations in counties by one year.
- 2) Develop and test methods of determining soil performance and potentials for agriculture. We will acquire agronomic data keyed to soil type, in cooperation with groups such as Agricultural Research Centers, Soil Conservation Service, pest management groups, farm organizations, and agricultural consultants. This soil performance and potentials information will be extrapolated to areas with similar soils and climates.
- 3) Write technical publication on the measurement of erosion rates in Montana based upon the redistribution of radioactive cesium-137 that was fixed on soil particles following nuclear testing and fall-out in the 1950's.
- 4) Continue development of computer-assisted information systems that will deliver useful soil resource data from Federal, State, and University files to individual citizens (farmers, ranchers, and others) via telephone, telecommunication networks, magnetic tapes, and microcomputer diskettes.

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TITLE: Dryland Cereal Production in Montana Based on
Cereal-Legume Rotations

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: James R. Sims

AMOUNT FUNDED: \$12,800.00

OBJECTIVES:

- 1) Adapt annual-legume/cereal rotations (Ley Farming) to dryland cereal production to major winter and spring grain production areas in Montana.
- 2) Relate adaptability of annual-legume/cereal rotations to climatic factors and soil properties.
- 3) Determine reduction in N fertilizer requirement for maximum grain yield following annual legumes grown for green manure.
- 4) Compare protein levels, test weights, and baking quality parameters of wheat produced with legume N and wheat produced with fertilizer N.

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TITLE: Winter Wheat Improvement

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: Allan Taylor, Hollis Pitler, Sadiq Chaudhry,
Janet Goodell, Mohamed Al-Khawlani, Maher
Noaman, John DeNoma, Phil Becraft

AMOUNT FUNDED: \$47,630.00

OBJECTIVES:

- 1) General support of winter wheat breeding project.
- 2) Breeding wheats which produce highest grain protein along with high stable yields.

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TITLE: Equipment for Winter and Spring Wheat Breeding
Programs

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: Allan Taylor, W. Larry Alexander

AMOUNT FUNDED: \$12,000.00

OBJECTIVE:

- 1) To upgrade equipment in wheat breeding programs.